RESAC APPLICATIONS MATRIX

NASA Earth Science Enterprise Applications and Commercialization Themes

RESAC Consortium	Food & Fiber	Natural Resources	Environmental Quality	Urban & Infrastructure	Natural Hazards	Health & Human Safety	USGCRP
Great Plains RESAC	✓Calibration of NDVI values and NDVI-based vegetation phenology ✓AVHRR-based crop yield models ✓Vegetation damage assessment maps ✓Potential agricultural hazards mapping from multi-temporal RS data ✓Use of multi-temporal VPM predict agricultural land values	Use of vegetation phenology metrics for habitat modeling	Use of AVHRR and MODIS to create land cover/land surface maps for direct ingestion into numerical environmental models				✓Regional analysis of interannual climate variability to identify sensitive and at-risk areas ✓Examination of linkages between climate variability and land use/land cover patterns
Midwest Center for Natural Resource Management	✓Evaluating forest growth, health and carbon sink strength using remote sensing fed models ✓Soil moisture maps, grain-moisture-vs.-time maps, nitrogen budget maps, pest-and-disease maps for precision agriculture						Regional ecosystem study of atmospheric CO_2 and climate change effects on water balance
Upper Great Lakes RESAC	✓Regional commodity inventories ✓Seasonal/temporal dynamics of vegetation phenology for trend analysis ✓Improving accuracy and efficiency of forest inventories	Improvements in regional and local landcover maps using nested imaging system	Monitoring of the trophic state of lakes				Assessing the linkages between changes n land resources and impacts on water resources
Southwest RESAC	✓Improved streamflow models for agriculture water rights ✓Modeling and mapping of noxious weed encroachment ✓RS-based forest and range status maps	✓Improved streamflow forecasting integrating RS-derived snowpack info into hydrologic models ✓Improved snow cover estimates in forested areas using RS imagery ✓Land cover and change detection maps for improved determinations of water yield, interception, and evapotranspiration		Improved groundwater and reservoir management in southwest urban areas	Flash flood forecasts for SW cities using improved hydro-climate modeling	Improved understanding of the effect of rainfall patterns on the occurrence of southwest diseases (Valley Fever, Hantavirus, Plague, etc.)	✓Decadal scale changes in snow cover, vegetation, and land use patterns ✓Provide data management and information system for Southwest Climate change researchers
California Water Resources RESAC	Seasonal streamflow forecasts for agricultural guidance and long-term climate projections for sustainable agricultural management	✓Short term numerical weather predictions, quantitative precipitation and streamflow forecasts for central and coastal CA watersheds ✓Improved channel habitat change monitoring through river networks	✓RS-based contaminant identification and monitoring of Sierran Foothills mine sites ✓Six-hour predicted runoff and streamflow for the San Joaquin River to determine water quality		✓Development and testing of dynamic sediment transport and landslide hazards prediction ✓Satellite imagery/hydrologic model linkage for timely flashflood warnings		Simulation of long-term climate variability and assessment of effects of $2xCO_2$ atmosphere on western US hydroclimate
NAUTILUS RESAC		✓Develop set of recommended protocols for producing high-res landcover maps from various high-res ESE and commercial data sources. ✓Create indices of forest and habitat fragmentation in suburban areas.	Use impervious cover maps for nonpoint source pollution modeling	✓Use neural networks and RS data to create impervious cover maps for urban watershed analysis ✓Generate indices for quantifying suburban sprawl using multi-temporal RS imagery			
Mid-Atlantic RESAC	✓Develop more accurate landcover maps to distinguish cropland from other grassy cover and classify crop species ✓Create precision environmental database for farm chemical mgmt.	Use high-resolution imagery to improve accuracy of riparian buffer mapping	✓Improve forest mapping to better predict nitrogen delivery into the bay ✓Mid-Atlantic pilot to develop and test methods for a national environmental monitoring framework ✓Provide improved land use and soil moisture data for climate models used in pollution studies	Use high-resolution imagery to drive regional land conversion models			Provide RS applications to help model regional NPP, water yield, and N retention
Southern California Center for Managing Fire Hazards					Integrate ESE imagery with mesoscale weather modeling and ground data for mapping fire hazard areas		Ecosystem services (chaparral health and management) and urban activities at the urban/wildlands interface
Northern Great Plains RESAC	✓DSS for farmers that predicts current soil water and models future soil water availability ✓Regional wheat quality assessment for fertilizer applications ✓Weed detection maps in soybean fields ✓AVHRR-based NDVI to evaluate available rangeland forage ✓GIS-based animal disease monitoring						✓Create Environmental Information Network to inform and educate the public about the changing climate and environment ✓Develop report of regional assessment for climate change/variability and socio-economic condition variability